Best practice guidance //

How to respond to vocal vaccine deniers in public





Abstract

This guidance document provides basic principles for a spokesperson of any health authority on how to respond to vocal vaccine deniers. The suggestions are based on psychological research on persuasion, on research in public health, communication studies and on WHO risk communication guidelines.

Keywords

VACCNATION
COMMUNICATION
SCIENCE DENIALISM
IMMUNIZATION
INTERVIEW PUBLIC
HEALTH

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Acknowledgements

This document was developed by the Vaccine-preventable diseases and Immunization programme of the WHO Regional Office for Europe. Lead authors were Philipp Schmid (University of Erfurt, Germany), Katrine Bach Habersaat (WHO) and Noni E. MacDonald (Dalhousie University, Canada).

The authors would like to thank Cornelia Betsch (University of Erfurt), Adam Finn (University of Bristol) and Robert Böhm (RWTH Aachen University) for their feedback during the development phase. The authors would also like to thank the participants of the pilot training (20 - 21 December 2016, Copenhagen, Denmark), the participants of the 2015 European Regional Meeting of National Immunization Programme Managers (1–3 September 2015, Antwerp, Belgium), the participants of the technical consultation on addressing vaccination opposition (31 May - 1 June 2016, Belgrade, Serbia), the participants of the workshops on how to respond to messages of vaccine deniers in public debates (17 – 19 October 2017, Stuttgart, Germany; 5 – 7 December 2017, Copenhagen, Denmark; 12 – 14 December 2018, Berlin, Germany) and the members of the European Technical Advisory Group of Experts on Immunization (ETAGE) for their feedback.

Chapter 1

Introduction

This guidance document provides basic principles for pro-vaccine spokespersons on how to behave and respond to vocal vaccine deniers in a public debate. Vocal vaccine deniers are individuals who do not accept recommended vaccines, are not open to a change of mind no matter the scientific evidence and are actively advocating against vaccination. The guidance in this document was developed based on psychological research on persuasion, on research in public health and communication and on WHO risk communication guidelines. The guidance is primarily intended for spokespersons of health authorities who want to prepare for a public event with a vocal vaccine denier.

This document offers strategies that address the three main elements of successful communication, the audience, the speaker and the argument[1,2]. Psychological research has provided useful insights on how to frame messages in response to misperceptions of any kind[3]. The document applies these insights to the specific situation of facing a vocal vaccine denier in a public event.

At public events and in visual media the audience will judge a spokesperson's credibility, trustworthiness and competence also by non-verbal aspects such as appearance, expression of emotions, eye contact and response time[4]. Such aspects are also covered in the document.

Research indicates that no one is born a good speaker[5], and facing vocal vaccine deniers in the media or at a public event can be fraught with angst. The guidance and recommendations of this document cannot substitute for training in rhetoric and interview skills. They provide input, inspiration and a framework for developing messages and preparing for facing the vocal vaccine denier.

The document suggests that the goal of any public encounter is to strengthen the resilience of the audience against anti-vaccine rhetoric. To reach this end, two rules are suggested as guiding principles for preparations and responding to a vocal vaccine denier in a public debate. These are presented in Table 1 and elaborated in the following chapters.

Table 1: Two rules that aim to strengthen the audience's resilience against anti-vaccine rhetoric.

Rule 1	The general public is your target audience, not the vocal vaccine denier
Rule 2	Aim to unmask the techniques that the vocal vaccine denier is using and to correct the content of their messages
Goal	Foster resilience among the audience against anti-vaccine statements and stories: strengthen those who are vaccine hesitant and support those who intend to vaccinate in their decision to accept vaccination

1.1. What situation does this document address?

The recommendations provided here are broad principles to counter arguments of vocal vaccine deniers in a public discussion (Figure 1). This refers to a situation with a public audience whose perceptions related to the spokesperson, the topic and health authorities can be affected by the spokesperson's response. This includes dialogue that is taped or recorded and then made accessible to a broader audience.

These are public, not interpersonal situations. The strategies proposed are not applicable for discussions between a health professional and a denier in a private setting, such as an interaction with a religious leader or with a concerned parent.

Extensive psychological research has focused on optimizing interpersonal communication between a provider and a patient[6–8]; however, public and private dialogue is different in terms of what to respond, how to behave and whom to address. In the public event there is no reason to believe that the vocal vaccine denier can be convinced to support vaccination. Instead, the focus should be on appealing to the audience.

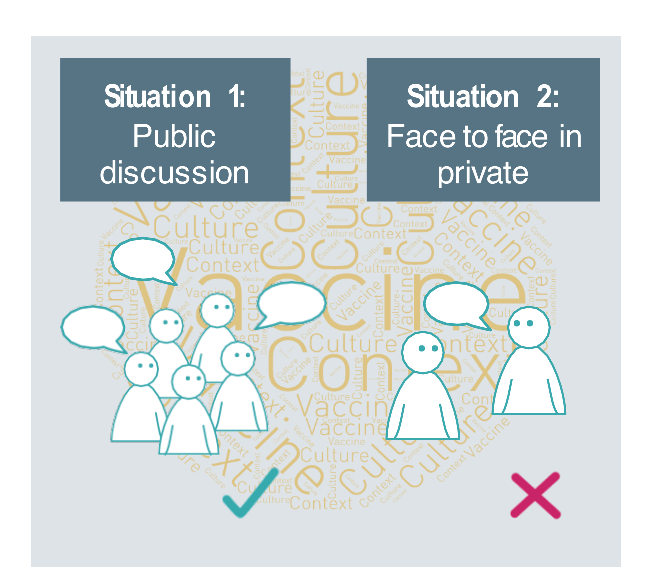


Figure 1: Two distinct communication situations with a vaccine denier; with or without a public audience. The recommendations presented in this document are solely applicable to a public discussion (Situation 1). Situations may vary depending on the context and content of the discussion and the specific vaccine that is addressed by the vocal vaccine denier.

1.2. The term 'vaccine denier'

Individuals who refuse to accept a recommended vaccine are commonly referred to as vaccine refusers. Research has defined vaccine *refusers* as a group within the vaccine hesitancy continuum who refuse all vaccinations without doubt[9]. However, even convinced refusers may still consider other opinions and can be convinced by scientific evidence and well-presented arguments.

'Vaccine deniers' refers to a subgroup at the extreme end of the hesitancy continuum; people who have a very negative attitude towards vaccination and are not open to a change of mind no matter the scientific evidence[10] (Figure 2). Vaccine deniers may even counter-react to evidence-based arguments[11]. The vaccine denier has characteristics that are similar to other types of science deniers and to religious and political fanatics in that they adhere to a belief that is impossible to challenge, even if challenge is the fundamental tenet of scientific progress[12].

The term movement as a description for vaccine deniers is misleading. A movement implies the image of a powerful, coordinated group, united by a shared collective identity[13]. However, in most European countries vaccine refusers or deniers represent a small group of individuals with diverse reasons for not accepting vaccines[9]. Of this minority, only a few actively engage in behaviour that seeks to undermine public health activities and can be considered vaccine deniers. These few deniers do not represent a movement.

For the purpose of this document,
vaccine deniers refers to individuals who do not accept vaccination, deny scientific consensus and evidence related to vaccination.

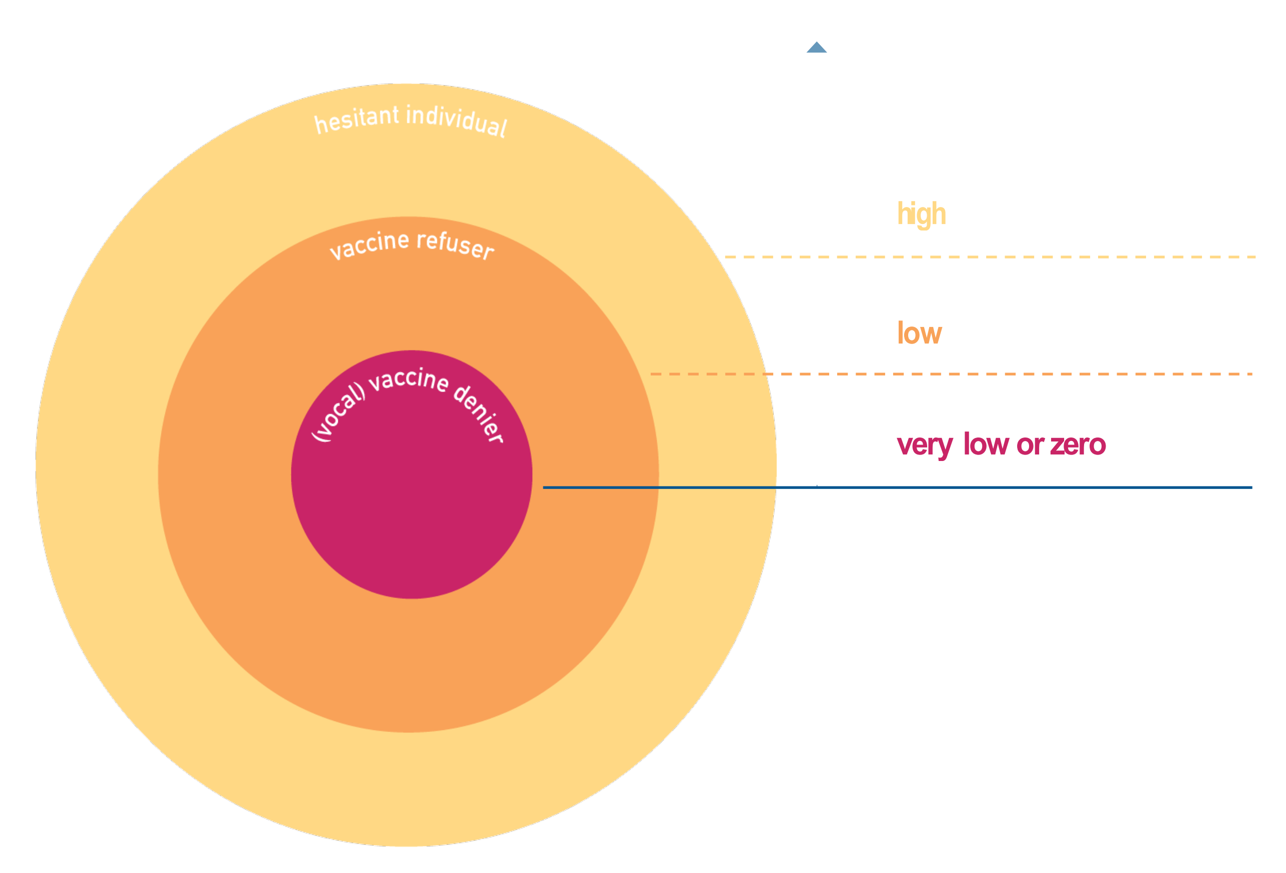


Figure 2: Vaccine hesitancy categorized by the likelihood of a change of mind regarding vaccine acceptance.

1.3. The term ‘vocal vaccine denier’

A *vocal* vaccine denier is defined in this document as a person who is not only denying scientific consensus but also actively advocating against vaccination and employing rhetorical arguments to give the appearance of scientific debate (uncertainty) related to the science supporting vaccination[14]. Vocal vaccine deniers are not only refusing vaccination for themselves or their children, friends and family; they are doing an effort to discourage the general public from vaccinating as well.

Denying the effectiveness or safety of vaccination is as old as the introduction of the first vaccine[15]. The arguments against vaccination have changed very little. Research has examined the actions often undertaken by vocal vaccine deniers to spread their messages[16,17] (Table 2).

Science denialism research provides further insights into the arguments that are used by vocal vaccine deniers[14,18]. Designing messages to respond to these is a key objective of this document.

Table 2: Actions undertaken to spread messages of vaccine denialism. Adapted from Leask and Chapman[16] and Kata[17]

1. Skewing the science	2. Shifting hypothesis
Vocal vaccine deniers ignore and reject scientific evidence that counters their arguments. They only consider results that seem to confirm their belief. These results either do not represent the scientific consensus, are poorly conducted or misinterpreted by the	Vocal vaccine deniers change the topic that they are addressing when they fear to lose an argument. They are willing to claim any hypotheses that seems to support their core statement i.e. vaccines cause harm.
3. Censorship	**4. Attacking the opposition**
Vocal vaccine deniers shut down critics and avoid open discussions. They ban comments or authors from communication platforms (social media, blogs etc.) and censor opposing opinions.	Vocal vaccine deniers use personal insults and even legal actions to silence representatives of the scientific consensus.

Individuals who refuse vaccines are a heterogeneous group. They have diverse, often personal reasons for not vaccinating[19,20] and variable degrees of conviction regarding this mindset.

The group of vocal vaccine deniers includes conspiracy-theorists, some of whom are well aware of the available scientific literature[15]. They have either integrated the available knowledge about vaccination into their perspective or have integrated only selected evidence that seems to confirm their beliefs (confirmation bias) [21].

The diversity of motivations leading to vaccine denial is wide[19,22] (Table 3) and in most cases cannot be altered by scientific evidence.

Table 3: Motivations to reject science about vaccination. Adapted from Hornsey et al.19,22 and extended with insights from Amin et al. 23

Personal identity expression	People can be motivated to reject science about vaccination in order to express their identity as a nonconformist or a reactant individual.
Conspiratorial ideation	People can be motivated to reject science about vaccination to express their belief that those in power are hiding the truth.
Financial interests	People can be motivated to reject science about vaccination because they profit from spreading an anti-vaccine attitude.
Fear of needles & disgust	People can be motivated to reject science about vaccination to rationalize their fear of needless and their disgust towards hospital settings.
Expression of moral values	People can be motivated to reject science about vaccination to express their moral value of purity.
Social identity needs	People can be motivated to reject science about vaccination to align with social norms of their peers.

Chapter 2

The target audience

A true discussion acknowledges different points of view and tests the strengths and weaknesses of different arguments. Effective scientific discourse requires that everyone contributing to the discussion is willing to evaluate all the quality evidence available, to accept conversational norms and to set the increase of knowledge as the primary common objective of the discussion.

A media or public debate is not a true scientific discussion. In addition, vocal vaccine deniers will rarely adhere to these basic premises[10,14]. Trying to persuade a vocal vaccine denier to change their view in a public discussion will most likely fail. The goal of the public discussion with the denier cannot be to change the mind of the vocal vaccine denier.

The target audience for the pro-vaccine spokesperson is the public watching or listening to the debate (Table 4). The discussion is an opportunity to inform undecided members of the audience (fence-sitters[24]), convince sceptics and strengthen the knowledge and arguments of all. This may also strengthen resiliency amongst those in the audience who support vaccination[25].

The key messages are meant to debunk misconceptions about vaccination, equip the general public with knowledge that counters the arguments of a vaccine denier and sustain trust in health authorities and the immunization programme.

Table 4: First rule to make the public resilient against anti-vaccine rhetoric.

Rule 1	The general public is your target audience, not the vocal vaccine denier

2.1. Understanding the target audience

When designing messages for the general public, it is important to bear in mind that people do not necessarily process information in a rational manner. Human tendencies to deviate from a rational standard, so-called biases, have been revealed through extensive studies in experimental psychology for decades[26–28].

The biases which have been identified are the result of mental shortcuts (heuristics[27]) that help individuals to make decisions in a complex world (Table 5).

These biases explain how the public audience processes information related to vaccination. As such, these biases can provide guidance for designing messages that debunk misconceptions[29].

Biases also explain:

- how individuals may make decisions when faced with uncertainty (see *negativity bias*[30]),
- why it is difficult to use statistical data as an argument (see *narrative bias*[31]),
- why you need to be cautious when refuting a misinformation (see *backfire effect: familiarity*[32–34]),
- why it can be almost impossible to reach certain groups even though you have followed all guidelines of designing an optimal message (see *confirmation bias*[35]).

Table 5: Cognitive biases used by individuals when making decisions on vaccination.

Negativity bias

The negativity bias reveals that individuals trust scientific studies more when they report a health risk that could potentially harm people than studies that indicate no risk for people[29]. This effect is independent on the perceived credibility of the source of the study. This means that the audience will also judge the trustworthiness of a message by its content and not only by the spokesperson's credibility.

The audience trusts negative information more than positive information

Narrative bias

A narrative is an emotionally impactful story often highlighting a personal experience. Media often use such narratives to convey a complex topic in a simple and emotional manner. However, due to the narrative bias, narratives have great influence. Even if people know the statistical evidence related to vaccine side effects, research has shown that the more narratives about vaccine side effects they read, the higher is their perception of risk of side effects[30]

The audiences' ability to think rationally is easily distorted by narratives

Confirmation bias

People tend to seek for and interpret information in a way that confirms their initial beliefs – especially in discussions where they are personally engaged[34]. This so-called confirmation bias is a potential explanation of why irrational beliefs like "the MMR vaccine can cause autism" remains a critical issue in debates on vaccine safety.

The audience focuses on messages that confirm their beliefs

Backfire effect: Familiarity

Debunking a myth, spokespersons often repeat the myth itself. Psychological studies reveal that an attempt to debunk a myth while at the same time mentioning the myth can have a negative impact[32] or even backfire and spread conflicting knowledge[33,35]. This happens as individuals often forget details of a message and judge the truth of a statement by its familiarity: "I think I have heard that before, so it is likely to be true."

You can create or foster false knowledge by trying to debunk it

Debunking

Research on debunking misconceptions does not only help to avoid pitfalls. It also helps prepare messages to mitigate the influence of myths. If a spokesperson wants to correct a misconception, it will not be enough to label the belief as false. The audience is seeking explanations and tends to believe corrections that provide an alternative to the myth[3].

Therefore, a useful correction of a myth explains why it is incorrect and also provides an alternative. This knowledge can structure responses to vaccine deniers and is used for the algorithm in chapter 4.

The audience seeks for explanations of why a message of a vocal vaccine denier is incorrect.

Chapter 3

The speaker

Facing a discussion with a vocal vaccine denier, you (as the spokesperson) should always remember that the most substantial arguments are on your side. Having a vast body of evidence agreed by the majority of scientists to back up your position makes you well-prepared from a scientific perspective. The scientific consensus that you are representing can serve as an initial “gateway” through which to influence your audience’s key beliefs and increase their support for public policy in support of immunization[37]. Emphasizing the existing scientific consensus on vaccine safety can reduce public concerns and misperceptions[38]. You should emphasize how overwhelmingly the evidence supports vaccine safety and efficacy – not just one or two studies – and that the vast majority of scientists and clinicians in the field agree with this.

Remember, you are representing the scientific consensus.

Scientific research on communication shows that the quality of the evidence you provide not only influences the audience's attitudes towards a health treatment but also increases your credibility[2]. Additionally, presenting messages that contain scientific evidence influences people's attitudes more persistently and makes people more resilient in comparison to affective associations or simple allegations used by deniers. This implies that in order to be perceived as a credible spokesperson and to influence the audience's attitudes toward vaccinations you need to focus on the evidence.

Key messages need to be well grounded.

3.1. Who should be the spokesperson?

It is not just what you say but also how you say it. Awareness of the scientific facts about vaccines does not necessarily make you a good presenter of the evidence, let alone a good discussant. The way you speak and present evidence and the way you listen to the participating parties of the discussion are key deciding factors for a successful media performance.
In conjunction with the do's and don'ts (see 3.2.), these skills are much needed to ensure an optimal response to a vocal vaccine denier in a public discussion. Even a very good speaker should consider chapter 9 "Should you participate?" before attending a public discussion.

3.1.1. Being a good speaker

Good spokespersons are often described as charismatic, self-confident, captivating and visionary[39]. Charisma is not so much an inherent uniqueness, but rather the result of attainable practices[40].

In any debate, 12 oratory practices can help you become more charismatic in the eyes of the audience[41] (Table 6).

Table 6: Oratory practices of charismatic leaders. Taken from Antonakis et al.[41].

Verbal

Metaphors	Stories and anecdotes
A figure of speech with an implied comparison: "Vaccination is a firewall that protects the weak in our community."	A simple narrative: "This reminds me of a patient that came to my office and asked..."
Expression of moral conviction	**Contrasts**
"The weakest members of our community are unprotected. We must not risk the health of our community by refusing vaccination."	Setting a position against the opposite: "I became a physician not because of the great pay but because I knew I could help save lives."
Reflection of the group's sentiment	**Rhetorical questions**
Revelation of your personality for the audience to resonate with you: "I know what is going through your minds because I feel the same"	A figure of speech question to emphasize your main point: "Do we really want give up one of our greatest achievements in public health?"
Setting of high goals	**Three-part list**
A motivation technique that aligns the audience behind a common goal: "By the year 2020 we will have doubled the uptake rates."	An easy to remember list: "First we need to understand oratory techniques. Then we need to apply them. Finally, we will become a charismatic spokesperson."



Conveying confidence
Convince the audience that the high goal can be achieved : "Even if all our partners back out…"

Nonverbal

Facial expressions	Gestures
Varying facial expressions and keeping eye contact can visually support your message and the sentiment you wish to convey.	Using gestures to support your voice and facial expressions can increase awareness and strengthen the message.
Varying the volume of the voice and the pace of your speech and using pauses allows you to highlight key messages and keep the attention of your audience.	

This is general advice. Your style must always match your personality, the situation, the cultural context and the person you are facing in the debate.

All these practices can be acquired through training and provide a foundation for becoming a charismatic spokesperson.

Being a good speaker can be learned.

3.1.2. Being a good listener

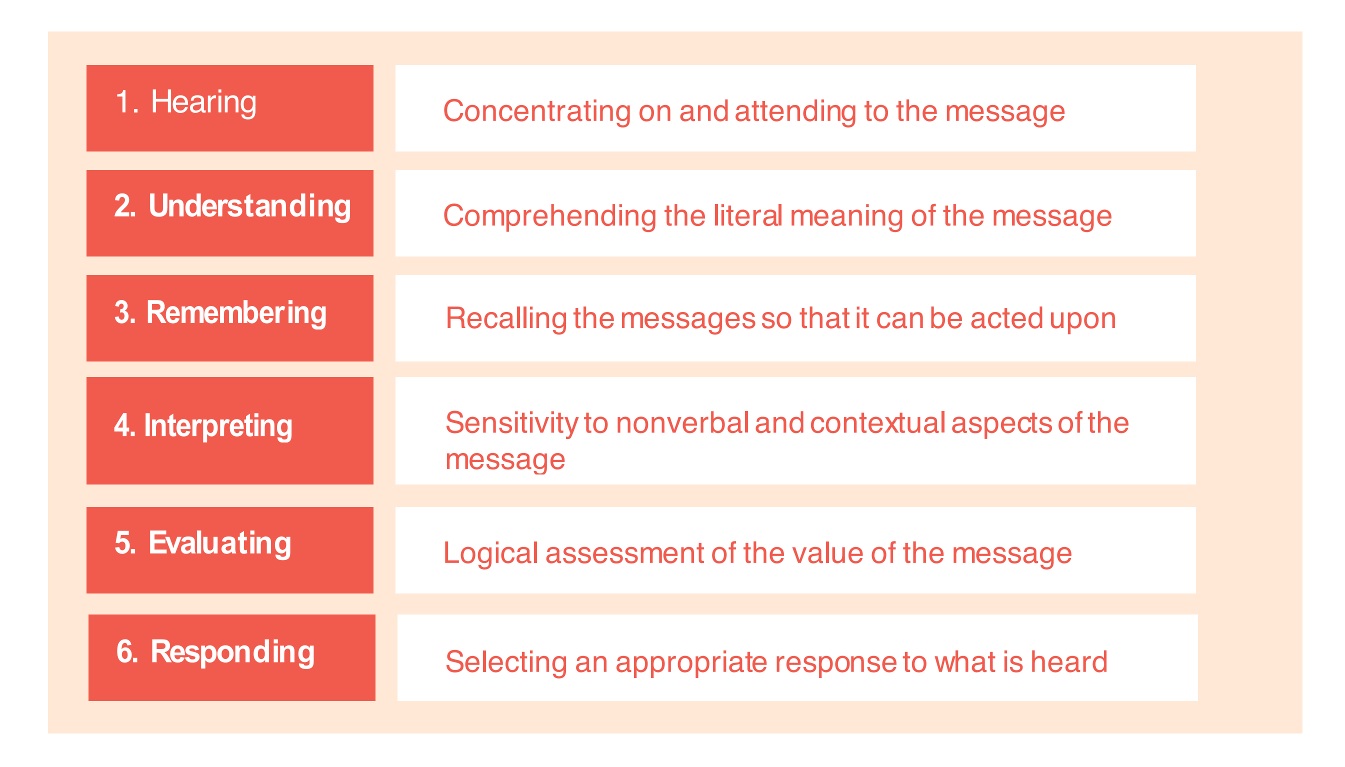
In communication studies the importance of listening in any communication process is unquestioned. To design effective messages, you need to listen to the denier. Even though your true audience is the general public watching or listening, it would be a mistake to ignore your discussion partner.

A discussion is not a platform for a monologue. The public will judge you by the attention, motivation and participation that you as a spokesperson demonstrate during the discussion. Your listening skills will be important for the public's judgement about your performance. Listening is an active process that includes all your senses and is not limited to hearing.

Researchers identified six interrelated components of listening that can be addressed and trained (Table 7). The HURIER model[42,43] (see also Annex 1) provides you with a theoretical visual depiction of components needed to train this competency.

Being a good listener can be learned.

Table 7: Interrelated components of listening. Taken from Brownell[43].



1. Hearing	Concentrating on and attending to the message
2. Understanding	Comprehending the literal meaning of the message
3. Remembering	Recalling the messages so that it can be acted upon
4. Interpreting	Sensitivity to nonverbal and contextual aspects of the message
5. Evaluating	Logical assessment of the value of the message
6. Responding	Selecting an appropriate response to what is heard

None of these listening and speaking techniques are easily acquired and even if they are mastered in a training environment, a spokesperson can still be overwhelmed by the stress triggered in a public discussion. The stress in a live-discussion is multiplied by the fact that there will be no opportunity to correct errors once they are made. In the face of well-trained journalists and rhetorically eloquent deniers, more than vaccine knowledge and simple communication training are needed (Table 8). Coping with stress, managing errors and avoiding rhetorical traps while staying focused and maintaining a confident appearance are skills that can only be acquired through media training and experience.

Do not participate in a public discussion if you are not trained for this.

3.2. Do's and Don'ts of communication

Table 8: General Do's and Don'ts of communicating in public.

Prepare key messages	Communicate what has been achieved
A person's memory is strongly restricted in capacity[44]. The audience will not be able to recall or even transfer the provided information when confronted with too much. However, to be persuasive you need to respond to the topics that are raised and not just reel off your own key messages. Use the topics of the algorithm (chapter 4) to prepare messages that reflect the topics that are often raised by deniers.	Celebrating gains, visualizing results and focusing on the continued common target, in this case community protection, are recommended strategies to uphold the public's motivation[45]. Furthermore, visible gains illustrate what needs to be done to reach the final goal. This also addresses the responsibility of each individual.
Prepare three key messages you really want the public to know and remember.	**Communicate what has been achieved so far and what needs to be done.**

Keep your key messages simple	Tell the truth
Do not use scientific jargon or acronyms if you can avoid them[46,47]. Research on cognitive psychology shows that unfamiliar words are less likely to be remembered or memorized and should therefore be avoided[48]. If you can, condense your main message into a simple, easily understood "sound bite" – that is, a less than 30 second message that captures your point in a riveting fashion.	Psychological research shows that even three-year-olds question the credibility of a source when they have been lied to[49]. Dishonesty damages the most important resource of any communication: trust[50,51]. In some cases health authorities do not know what caused a particular event, and they will need to wait for the results of an investigation. Also, it is impossible to declare that vaccines are 100% free of side-effects. In such cases, it is important to be honest and transparent.
Keep your key messages simple.	**Be honest and transparent.**

Repeat your key messages

If you repeat information your audience will be more likely to remember it and will perceive it as more valid[52]. It also allows you to focus on the key message in a heated discussion. However, if used excessively, repeating your messages can also be perceived as ignorant. Find a balance between listening and responding to the topic and returning to key messages. Again, prepare messages based on the topics you know are often raised by deniers.

Repeat your key messages as often as reasonably possible.

Avoid humour

Humour has long been discussed as an effective strategy to increase the persuasiveness of a message[53]. However, this benefit is absent in the context of health[54], which could be explained by the fact that humour is easily misinterpreted or even perceived as offensive when used in an inappropriate context. It may be perceived as "joking" about a serious health issue and may even be interpreted as an insult when used in the context of vaccination.

Find other ways to appeal to your audience.

Do not repeat the anti-vaccine arguments

Repeating anti-vaccination information can inadvertently reinforce the misinformation you seek to correct[2], as the brain remembers repeated messages more easily[52]. Furthermore, if the discussion is also filmed, you may find your verbalization of the misinformation taken out of context and included in an anti-vaccination video.

Respond with correct information instead of repeating an anti-vaccine argument.

Do not question the denier's motivation

Motivational aspects drag the focus away from the facts, and they leave room for emotional, personal narratives that have been shown to increase the audience's perceived risk of adverse events[55]. Save such discussions for private personal interactions with refusers and deniers.

Avoid raising questions about the personal motivation of vocal vaccine deniers.

Use inclusive terms

Psychological research shows that high similarity between speaker and audience can increase the audience's compliance with a message[56]. You as a spokesperson cannot influence the similarity of demographic aspects between the audience and yourself, but you can underline the similarity by using inclusive terms like "we as parents" or "as members of a community".

Use inclusive terms to underline a shared identity with the audience.

Underline scientific consensus

Research related to vaccination and climate change shows that the belief in a scientific fact increases when consensus is highlighted[37,38]. However, identifying scientific consensus requires a thorough understanding of the specific area of interest and laypersons will not gain that knowledge all by themselves[60]. Therefore, highlighting scientific consensus in public is a powerful tool to transfer essential scientific knowledge and increase the belief in a scientific fact, especially when presented in a simple and short message[61,62].

Underline scientific consensus with regard to vaccine safety and efficacy.

Emphasize social benefit of vaccines

Vaccines benefit individuals and the society as a whole[68]. If enough individuals are vaccinated, then the so-called "community immunity" protects individuals who, for whatever reason, cannot be vaccinated. Psychological research shows that emphasizing social benefits in the context of vaccination can increase an individual's intention to vaccinate[57-59].

Make sure your audience understands the importance of community immunity.

Chapter 4

The argument

The arguments of vocal vaccine deniers have not changed much since vaccines were first introduced[15]. Listening to these arguments and analysing their common structure provides you with the necessary knowledge on how to effectively respond.

During a discussion, deniers tend to draw on a set of, often unrelated, arguments and misconceptions (Table 9 & Table 10). This makes it difficult to respond with a clear statement. Therefore, the following three steps are recommended to effectively respond to a vaccine denier in a public discussion (Figure 3).

STEP 1:

Identify the technique the denier is using to misinform the public.

Five common techniques used by science deniers are categorized below, as discussed by Diethelm and McKee[14].

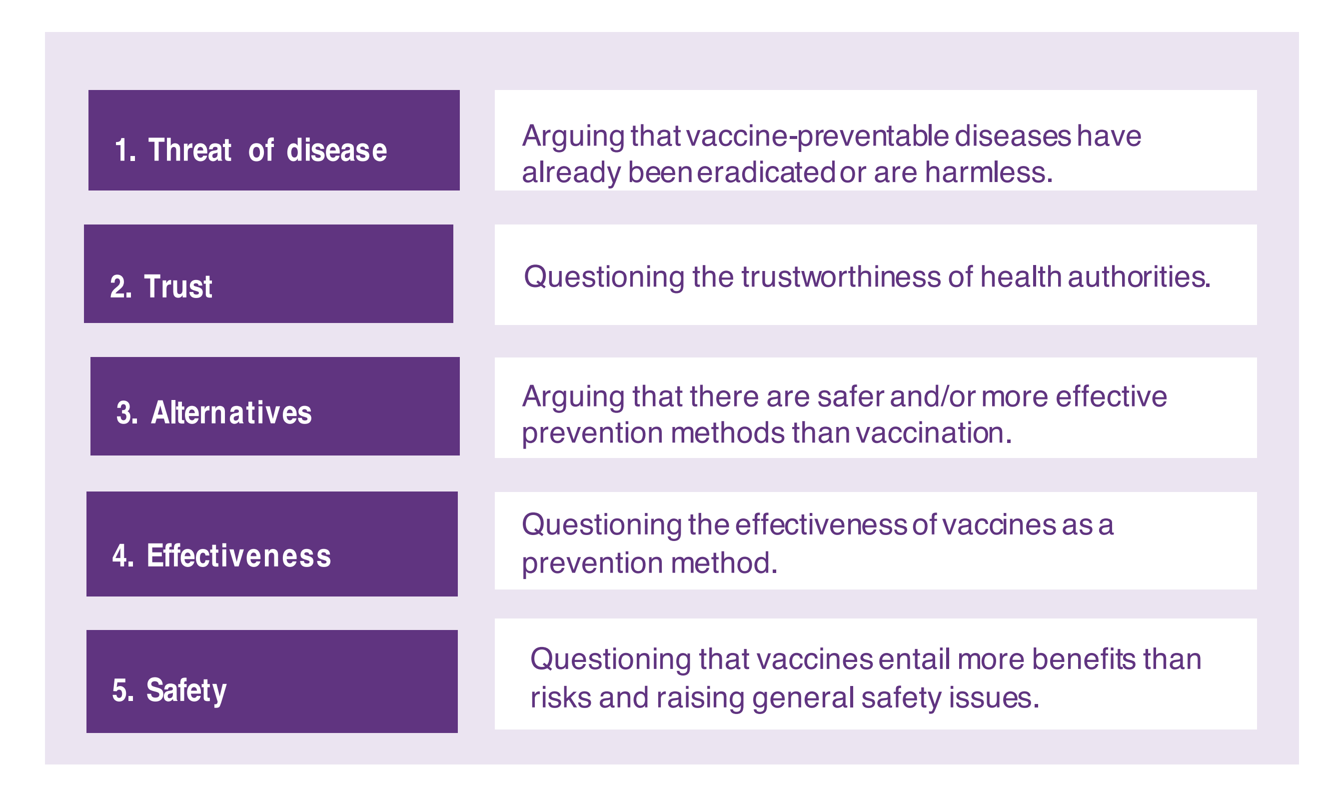
Table 9: The five characteristics of science denialism adapted from Diethelm and McKee[14].

1. Conspiracies	Arguing that scientific consensus is the result of a complex and secretive conspiracy.
2. Fake experts	Using fake experts as authorities combined with denigration of established experts.
3. Selectivity	Referring to isolated papers that challenge scientific consensus.
4. Impossible expectations	Expecting 100% certain results or health treatments with no possible side effects.
5. Misrepresentation and false logic	Jumping to conclusions, using false analogies etc.

STEP 2:
Disentangle the core points and address each separately.

The main topics related to vaccine denialism are categorized below and are based on research from the area of psychology and communication studies[16,63] as well as in-country experience from the WHO European Region.

Table 10: The five topics of vaccine denial. Based on prototypical messages of vaccine deniers[16,17] and WHO in-country experience.



1. Threat of disease	Arguing that vaccine-preventable diseases have already been eradicated or are harmless.
2. Trust	Questioning the trustworthiness of health authorities.
3. Alternatives	Arguing that there are safer and/or more effective prevention methods than vaccination.
4. Effectiveness	Questioning the effectiveness of vaccines as a prevention method.
5. Safety	Questioning that vaccines entail more benefits than risks and raising general safety issues.

STEP 3:
Respond with evidence-based message.

With the topic and technique in mind, you can then create a key message where you <u>unmask the technique</u> used by the vaccine denier and <u>respond to the topic raised</u> by the vaccine denier with an evidence-based message. Use it as a response supported by the Do's and Don'ts methods recommended in section 3.2.

Figure 3: The three steps in responding to vaccine denialism in public.

Step 1: Identify the technique	**Step 2:** Identify the topic	**Step 3:** Respond with key message
Conspiracy	Trust	Unmask the technique used
Fake experts	Threat of disease	Use key message that relates to the topic raised
Selectivity	Effectiveness	
Impossible expectations	Safety	
Misrepresentation / False logic	Alternatives	

Figure 4: Algorithm with sample key messages

Step 1: Identify the technique EXAMPLES of denier claims	Step 2: Identify the topic EXAMPLES of denier claims	Step 3: Respond with key message EXAMPLES of possible responses to the techniques and the topic
Conspiracies	**Threat of disease**	„Being a doctor or a researcher does not make a vaccination expert, and this source is what we call a fake expert.
The government is systematically hiding the real data.	Diseases are under control. There is absolutely no need to ask parents to run the risk of vaccinating their children.	Among vaccine researchers there is consensus that diseases can only be controlled if we remain vigilant and continue to vaccinate. Newborns and people with a weakened immune system cannot be vaccinated against certain diseases, such as measles. We all have a responsibility to protect them by vaccinating.
Fake experts	**Trust**	"The conspiratorial notion of this statement completely ignores
A new research manifest signed by 30 university researchers has been published. It says that...	The government receives kick-back from the pharmaceutical industry – it is a very profitable business for them.	the mass of scientific evidence produced by independent scientists all over the world and the benefits of vaccination in protecting entire populations from potentially life-threatening diseases. It also overestimates the power and discredits the motives of health authorities everywhere."
Selectivity	**Alternatives**	„It is false logic to claim that something is bad because it is not natural. Sometimes unnatural is good – for example a hip replacement – sometimes it is bad, such as chemical weapons.
This paper proves that 30% of people who are vaccinated against measles are not protected against the virus.	Natural prevention is so much better for our children than chemical and artificial solutions.	I will repeat what is supported by an overwhelming body of scientific evidence. There are no alternatives that are as safe and effective as vaccines."
Impossible expectations	**Effectiveness**	„This is cherry picking the data.
I am not against vaccination, but I will not recommend it to anyone until it is 100% safe.	The progress in health today is due to clean drinking water, better housing and better living conditions in general – not vaccination.	The fact is that there is overwhelming scientific evidence showing that vaccination saves millions of lives every year. Vaccination is one of the most successful and cost-effective public health interventions."
Misrepresentation / False logic	**Safety**	„Expecting 100% safety is impossible; no medical product or intervention, from aspirin to heart surgery, can ever be guaranteed 100% safe.
Vaccines are unnatural and therefore unhealthy for a natural organism like the human being.	How can I vaccinate my daughter if her safety cannot be guaranteed?	What we do know for sure is that the risk of vaccine-preventable diseases by far outweigh the minimal risks associated with vaccination."

4.1. Response to vocal vaccine denier

Once you have identified the topic, you choose one of your key messages.

If you were able to identify the denier's technique, this information can be added to your statement to strengthen your message. This may not always be possible. In either case, do not feel insecure and stick to your key message in addressing the topic. The following pages are worksheets that can be used to prepare and write your own responses to each combination of the topic addressed and the technique used by the denier (Table 11).

Table 11: Second rule to make the public resilient against anti-vaccine rhetoric.

Rule 2	Aim to unmask the technique that the vocal vaccine denier is using AND correct the content.

Figure 5: Worksheets to design Your key messages

	Threat of disease	Alternatives
Conspiracies		
Fake experts		
Selectivity		
Impossible expectations		
Misrepresentation and false logic		

	Safety	Effectiveness
Conspiracies		
Fake experts		
Selectivity		
Impossible expectations		
Misrepresentation and false logic		

	Trust
Conspiracies	
Fake experts	
Selectivity	
Impossible expectations	
Misrepresentation and false logic	

4.2. Beyond vocal vaccine deniers – Response to other discussants

Not everyone who spreads false information about vaccination in public is a vocal vaccine denier. Vocal vaccine deniers are motivated to reject science for a variety of different reasons (Table 3)[19,22]. A discussant can make a false claim simply because the discussant is misinformed[64], that is, the discussant repeats claims of vocal vaccine deniers without being one.

The discussant could be a concerned parent, who is biased in his or her perception, for example, due to the narratives he or she has read online (Chapter 2.1). The discussant could be the interviewer asking biased questions, for example, due to one-sided prior investigations (Chapter 2.1).

The discussant could also be an in principle pro-vaccine colleague of yours who simply pays little attention to the messages that he or she delivers.

The structure of the information stays the same. Whether the false information is coming from a vocal vaccine denier or is repeated by a misinformed individual who has no motivation to reject science, the topics addressed by the message and the techniques used to make them sound appealing are most likely covered by the algorithm outlined in Figure 4. You can also find an example on how to apply the same response to different possible discussants in Table 12 below.

Table 12: Using topic and technique rebuttal to counter impossible expectation in scenarios with varying discussants.

Vocal vaccine denier: Vaccine should be 100% safe!	„Expecting 100% safety is impossible; no medical product or intervention, from aspirin to heart surgery, can ever be guaranteed 100% safe. What we do know for sure is that the risks associated with vaccine-preventable diseases by far outweigh those of vaccines. In the worst of cases, infectious, but preventable diseases, such as measles, can kill."
Concerned parent: In my opinion my child deserves 100% safety!	„I completely agree that our children should get the safest medical products out there. We are after the same goal here. Unfortunately, expecting 100% safety is impossible; no medical product or intervention, from aspirin to heart surgery, can ever be guaranteed 100% safe. What we do know for sure is that the risks associated with vaccine-preventable diseases by far outweigh those of vaccines. In the worst of cases, infectious, but preventable diseases, such as measles, can kill."
Uninformed interviewer: I have heard that vaccines are not 100% safe! This is truly worrisome!	„Expecting 100% safety is impossible; no medical product or intervention, from aspirin to heart surgery, can ever be guaranteed 100% safe. We have to accept a certain degree of uncertainty in life. In the case of recommended vaccines this uncertainty is no reason for concern. What we should be concerned about are the potentially life-threatening complications of vaccine-preventable diseases, such as measles. These risks by far outweigh the adverse events associated with vaccines. In the worst of cases, infectious, but preventable diseases, such as measles, can kill."
Careless colleague: To be honest, I would like vaccines to be 100% safe too. But they are not.	„Please let me add the following to my colleague's statement. We all would like to have medical products that are 100% safe. Unfortunately, expecting 100% safety is impossible; no medical product or intervention, from aspirin to heart surgery, can ever be guaranteed 100% safe. What me and my colleague can tell you for sure is that risks associated with vaccine-preventable diseases by far outweigh those of vaccines. In the worst of cases, infectious, but preventable diseases, such as measles, can kill."

Within all four scenarios the information of the key message is the same. The only aspect that changes is the way the information is introduced and the way it is connected to the prior argument.

For approaches to informing the public using topic and technique rebuttal while avoiding polarization of the issue, see Chapter 6 on the embracing technique.

Chapter 5

Unfavourable interview conditions

Even trained spokespersons may find it difficult to stay calm and deliver key messages if, for example the interviewer is biased or has lost control of the session. Similarly interview conditions may be changed last-minute preventing you from preparing optimally. The advice presented in Figure 6 may help you prevent such unfavourable interview conditions.

Figure 6: Ensuring fair interview conditions



Insist on a previous agreement

Before you accept an invitation to a public discussion make sure you have a clear understanding of the format and your role during the discussion (see also chapter 9 below). Clarify any uncertainties beforehand and insist that the format is not changed (e.g. number of participants in the discussion, your role, seating arrangements, who the facilitator is, how questions are asked etc.).



Demand fairness

The facilitator or interviewer should make sure that all discussion participants have a fair opportunity to express their points. If you feel at a disadvantage, you can ask for better balancing. Do not react with anger; provoking an emotional response from you might have been the vaccine denier's intention in the first place. Leaving a discussion is not advisable, however, in very rare cases staying in the discussion and being unable to respond to untenable propositions of a vocal vaccine denier might be even worse.



Make the audience aware

If interview conditions are highly unfair it may be advisable to make the audience aware of this. However, in doing so stay calm and rational and do not allow the denier to provoke an agitated response from you. Simply state the facts and ask for fair conditions.

Chapter 6

Depolarization – embracing the opponent

A frequently used discussion ploy is the so-called *false dichotomy* or *black and white thinking*. The speaker simplifies a complex issue by reducing the possible perspectives to only two options; the unacceptable and the noble one. For example, deniers may present their point so they appear to only want what is safe for children while the health authorities only represent financial interests. Such polarization can be seen as a driver of the spread of misinformation because it prevents further dialogue between disagreeing parties[65].

Spokespersons are recommended to identify and respond to this technique and to refrain from using or accepting the black and white thinking pattern.

To depolarize the issue, it is recommended to *embrace* the denier. This can be done by acknowledging that the denier has good intentions and wishes to prevent harm, and by referring to the shared goal – e.g. safe, healthy and happy children. Spokespersons may also express an understanding of the personal experience and emotions that have led the denier to their conclusion. This embracing technique (Figure 7) can rebut the black and white perspective and create a sense of consensus which appeals to the audience (an example is illustrated Figure 8).

Figure 7: The embracing technique

Embracing

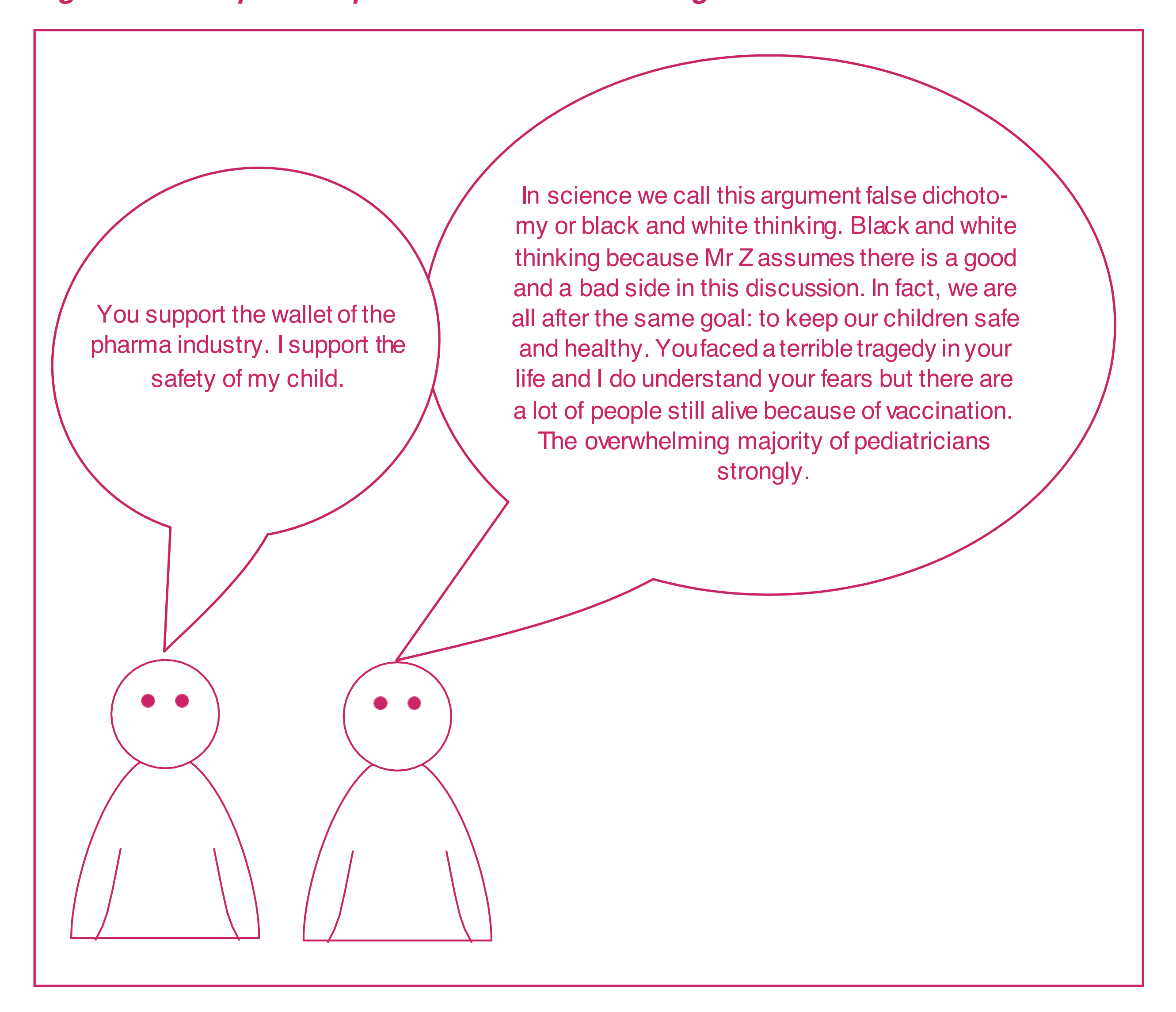


- Identify the technique known as *false dichotomy* and make the audience aware of the simplified 'black and white' thinking pattern which is being used by the denier to increase polarization.
- Highlight your common goal, e.g. to prevent harm or protect children.



- Acknowledge the fears and concerns of the denier.
- Acknowledge the experience and potential personal tragedies of the denier.
- Acknowledge the complexity of the issue and the difficulty to interpret evidence the right way.
- In doing so, avoid talking down to the denier to prevent you from appearing arrogant.

Figure 8: Example of depolarization via embracing:



Highlight the necessity of the scientific approach (knowledge and facts as opposed to feelings and assumptions) as the fundamental method to reach the common goal.

Chapter 7

Religious beliefs

Religious belief systems generally have no prescribed position on vaccination, as canonical texts, such as the Torah, Bible or Quran were written long before the introduction of the first vaccine. However, most religions prioritize the need to sustain human life and aim to protect the faith of the community and every individual within the community (see Table 13). As a consequence, major religions support vaccination[66].

Table 13: Perspectives of selected religions. Adapted from Grabenstein[66].

Jainism, Buddhism, Hinduism	Recognize the need to sustain human life, with "regretful acceptance" of cooking food, boiling water, using antibiotics and vaccines.
Judaism	Consider the imperative for *Pikuakh nefesh*, acting to save one's own or another's life.
Christianity	Vaccines with remote fetal implications are morally acceptable (with a duty to protect children), unless alternative products are available.
Islam	Consider the law to protect life, the principle of preventing harm (*izalat aldharar*) and the principle of the public interest (*maslahat al-ummah*).

Some members of religious groups are concerned about the compatibility of vaccination and their religious understanding of purity, the natural order or their religious dietary plans. For example, some Catholics are concerned about cells derived from aborted fetuses[67], some Muslims have issues with viral vaccines that include porcine gelatin or trypsin residues[68], and some Christian Scientists believe that health prevention is superfluous when trusting in prayer[66]. These concerns can have serious consequences as vaccine hesitancy in close communities increases the risk of disease outbreaks[69,70].

Still, representatives of the major religions generally assert positive attitudes on vaccination, and many faith communities actively support the distribution of vaccines and disseminate vaccination information in their communities[71].

Catholic concerns about cells derived from aborted fetuses

Immunization with fetal tissue culture cell lines used in the production of some viral vaccines has been deemed acceptable by Catholic religious leaders[66].

The official Roman Catholic position is that being immunized with vaccines that use fetal tissue cell lines originally derived from aborted fetuses (more than five decades ago to grow the viruses needed for the vaccine) is acceptable because these fetal derived tissues came from abortions that were not done for the intent of making these cell lines[66,67].

Muslim concerns about porcine gelatin or trypsin residues

Also the Muslim concerns about potential trace porcine components in some vaccines have been directly addressed by multiple imams and other Islamic leaders, stating that immunization is consistent with Islamic principles and referring to the necessity of the product to save lives, the lack of alternatives and the extensive dilution of the component during vaccine production[66].

7.1. How to respond to religious concerns?

Opportunities for a face-to-face meeting should always be explored before engaging in a public discussion with religious leaders. Both parties aim at protecting lives and public discussions should be avoided that might leave the impression of a controversy where there is none.

As described above, the major religions do not have a position against vaccination. If a vocal vaccine denier raises religious concerns, this is likely to reflect his personal concerns regarding vaccines[72]. Still, it is generally advised to avoid questioning religious beliefs and engaging in discussions about incompatibilities of religious beliefs and scientific evidence.

Spokespersons are advised to focus on how science and faith communities together can ensure the well-being of the society and each individual. An open dialogue may enable health authorities and religious authorities find a compromise that respects the values of the faith community yet enables people to benefit from the scientific progress of safe and effective vaccines.

Chapter 8

How to behave in a passionate debate

In a heated discussion you may wonder whether it is better to act passionately or to avoid emotions.

If you are a passionate person and speaker, try to control your temper and relax. Never get personal or direct attacks to your adversary's lifestyle, integrity or honesty. Crisis and emergency risk communication principles suggest that staying calm in discussions involving risk is important for sustaining trust[73]. Anger, fear and hostility can undermine the words spoken. By staying calm, you stay in control of the situation and you are better able to concentrate on the best responses to the denier's comments. Your comments should be driven by facts, not emotions.

If you manage to control your temper, then you can turn your passion into promotion of your argument. Research shows that passion can potentially influence the success of a speaker and increase the speakers own confidence[74,75].

Psychological theories suggest that only audiences with a certain level of personal involvement in the issue are convinced by messages of good contents and quality[76]. If members of the audience are not particularly interested in the issue, they will pay less attention to the content and more to the so-called periphery cues such as the passion or non-verbal expressions of the speaker (see chapter 3.1). Even if the audience is highly involved and evaluates the quality of arguments, periphery cues can add to the persuasiveness of a message[76].

So, if passion is appropriate in the culture and context, this may help you get the message across. The quality of your message must remain your priority. Passion is no substitute for rational arguments. You and the denier can both be passionate about the issue, but your strength is the quality of your arguments.

In addition, many spokespersons, especially if untrained, will find it easier to focus on good arguments if they remain calm and less passionate.

Chapter 9

Participating – or not

Facing a vaccine denier in public provides opportunities to deliver key messages, appeal to the audience, inform undecided individuals, equip vaccine advocates with evidence-based messages and even convince sceptics.

Especially in a time of crisis it may be critical to mitigate the negative impact of vaccine deniers on the public and to use any opportunity to reach out to the public. Not participating may also be interpreted as unwillingness to discuss vaccination issues in an open and transparent way.

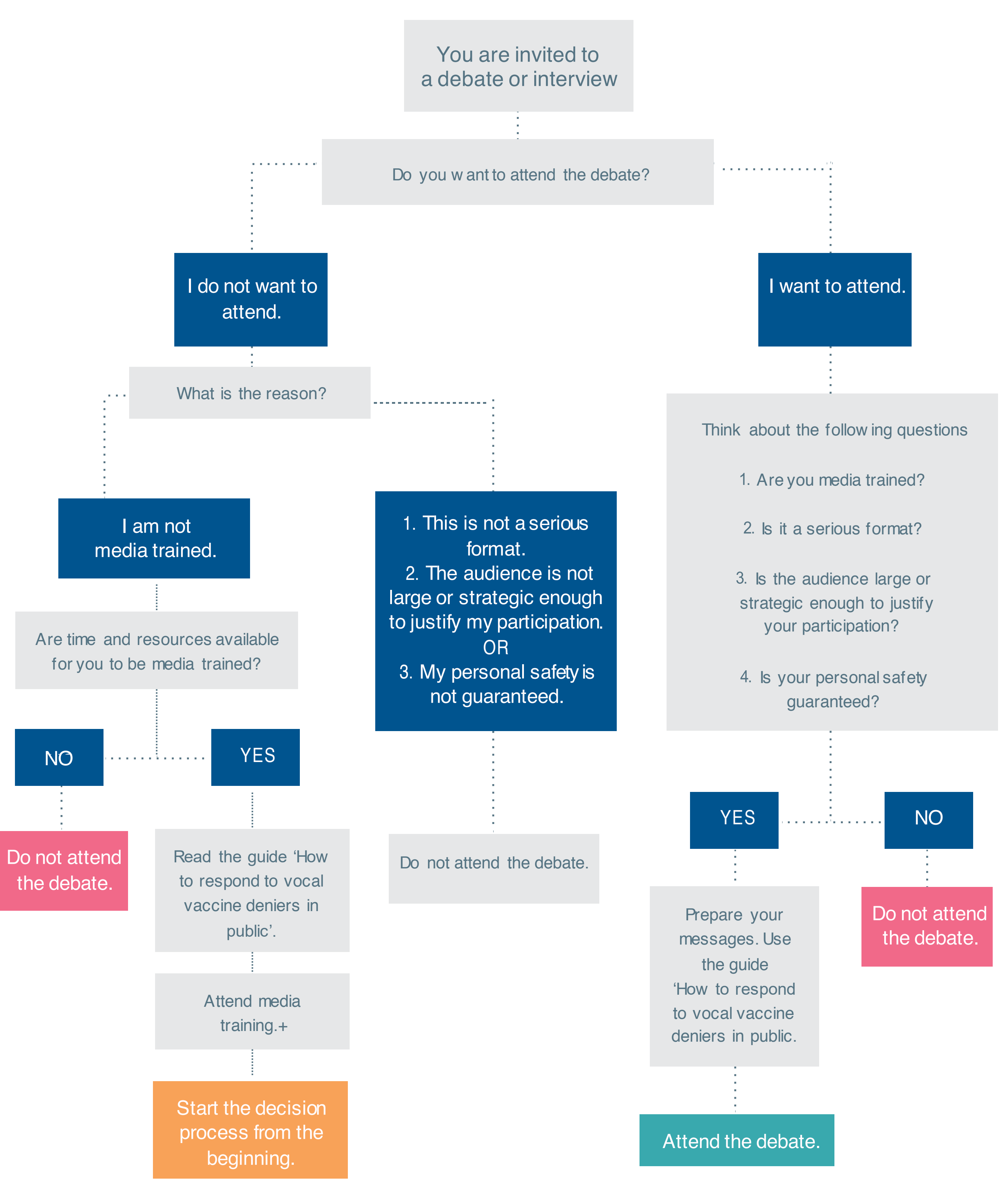
However, under some circumstances the risks of attending the discussion outweigh the potential benefits, and you should always carefully consider whether to participate or not.

Use Figure 9 to guide you in your decision.

As a general principle you should be cautious to participate under the following conditions:

- you are not media trained;
- you do not have sufficient time to prepare;
- the content, focus or format of the discussion are unclear or repeatedly changed;
- the format of the discussion does not seem serious;
- the audience of the discussion is not relevant or large enough to justify your participation;
- the journalist is unwilling to listen to you or brief you properly;
- you suspect that the discussion may be too biased against vaccination (e.g. judging by the number of deniers invited or previous experience with the journalist);
- your safety during the discussion cannot be guaranteed.

Figure 9: Should you participate? Things to consider when deciding to face a vocal vaccine denier or not.



+ Consider attending the training 'How to respond to vaccine deniers?' See chapter 11 for further information.
++ Remember: The document does not make up for professional media training. If you want to learn more about the issue then please see chapter 11 for further information.

Chapter 10

Fake experts – Predatory publishers

Internet has created new opportunities for the scientific community to share data, publications and education materials[77]. However, it also provides potential for abuse as anyone can pretend to be an expert and spread misinformation. This has been taken to the extreme by so-called predatory publishers that copy the appearance of academic journals from reputable publishers while disregarding the requirements of quality peer reviewed science and quality editorial review[78–80].

These publishers ask researchers to submit papers to their journals that mimic titles and publishing outlets of well-established, high standard scientific journals, but provide neither a transparent editorial policy nor adhere to the ethical guidance of the global editorial association. In doing so, they make profit from researchers who may not be aware of these issues.

With over 900 existing predatory publishers and over 1000 predatory journals[81] the layperson and even researchers can be affected by their data even if they have not passed a proper scientific evaluation.

Initiatives within the scientific community have been taken to address this issue[78–80,82], such as the checklist to identify reputable publishers and guidance in submission processes[78].

As a general rule, scientific articles should be treated with caution if:

- articles are not indexed in a scientific database such as Medline (PubMed);
- articles are published in a journal with no impact factor;
- articles are published in an open access journal not listed in the directory of open access journals;
- journal metrics cited come from sites that are not transparent, sites where the scores increase every year, sites that may use Google Scholar for calculating metrics (Google Scholar does not screen for quality and indexes predatory journals), sites where the methodology used in calculating the metrics appears suspicious[81].

If the denier is referring to a predatory journal during a discussion, you can address this issue as an example of the technique fake experts (see Figure 4). Make sure audiences are aware that these journals publish with no quality peer review.

Chapter 11

What now?

You have already made an important step in preparing yourself for a public discussion with a vocal vaccine denier by reading this document. However, scenario-based training is essential to be able to put the outlined theory and recommendations into practice.

Only by training your responses and facing honest feedback provided by colleagues and experts in the field of debating will you be able to improve your impact in a public discussion. Therefore, the WHO Regional Office provides workshops on the issue of how to respond to vocal vaccine deniers for spokespersons of health authorities in Member States.

For additional information on the general issue of how to respond to vocal vaccine deniers and on the workshops, please visit the website:

➔ **www.euro.who.int/vaccinedeniers**

References

1. Cope, E. *An introduction to Aristotle's rhetoric*. (London [u.a.] : Macmillan, 1867).
2. Hample, D. & Hample, J. M. Persuasion About Health Risks: Evidence, Credibility, Scientific Flourishes, and Risk Perceptions. *Argumentation & Advocacy* 51, 17–29 (2014).
3. Cook, J. & Lewandowsky, S. *The debunking handbook*. (2011). doi:10.1017/CBO9781107415324.004
4. Burgoon, J. K., Birk, T. & Pfau, M. Nonverbal Behaviors, Persuasion, and Credibility. *Hum. Commun. Res.* 17, 140–169 (1990).
5. Ericsson, K. A., Prietula, M. J. & Cokely, E. T. The Making of an Expert The Making of an Expert. *Harv. Bus. Rev.* 1–9 (2007).
6. Duggan, A. Understanding interpersonal communication processes across health contexts: Advances in the last decade and challenges for the next decade. *Journal of Health Communication* 11, 93–108 (2006).
7. Kaufman, J. *et al.* Face-to-face interventions for informing or educating parents about early childhood vaccination. *Cochrane Database Syst. Rev.* (2018). doi:10.1002/14651858.CD010038.pub3
8. Rollnick, S., Miller, W. R., Butler, C. C. & Aloia, M. S. Motivational Interviewing in Health Care: Helping Patients Change Behavior. *COPD J. Chronic Obstr. Pulm. Dis.* 5, 203–203 (2008).
9. MacDonald, N. E. *et al.* Vaccine hesitancy: Definition, scope and determinants. *Vaccine* 33, 4161–4164 (2015).
10. Lewandowsky, S., Mann, M. E., Brown, N. J. L. & Friedman, H. Science and the public: Debate, denial, and skepticism. *J. Soc. Polit. Psychol.* 4, 537–553 (2016).
11. Nyhan, B., Reifler, J., Richey, S., Pediatrics, G. F.- & 2014, undefined. Effective messages in vaccine promotion: a randomized trial. *Am Acad Pediatr.*
12. Popper, K. *The logic of scientific discovery*. (Abingdon-on-Thames: Routledge., 2002).
13. Diani, M. The concept of social movement. *Sociol. Rev.* 40, 1–25 (1992).
14. Diethelm, P. & McKee, M. Denialism: What is it and how should scientists respond? *European Journal of Public Health* 19, 2–4 (2009).
15. Wolfe, R. M. & Sharp, L. K. Anti-vaccinationists past and present. *BMJ* 325, 430–432 (2002).
16. Leask, J. A. & Chapman, S. 'An attempt to swindle nature': Press anti-immunisation reportage 1993-1997. *Aust. N. Z. J. Public Health* 22, 17–26 (1998).
17. Kata, A. Anti-vaccine activists, Web 2.0, and the postmodern paradigm - An overview of tactics and tropes used online by the anti-vaccination movement. *Vaccine* 30, 3778–3789 (2012).

18. Hansson, S. O. Science denial as a form of pseudoscience. *Stud. Hist. Philos. Sci. Part A* 63, 39–47 (2017).
19. Hornsey, M. J., Harris, E. A. & Fielding, K. S. The psychological roots of anti-vaccination attitudes: A 24-nation investigation. *Heal. Psychol.* 37, 307–315 (2018).
20. Betsch, C. *et al.* Beyond confidence: Development of a measure assessing the 5C psychological antecedents of vaccination. *PLoS One* 13, e0208601 (2018).
21. Wason, P. C. Reasoning about a rule. *Q. J. Exp. Psychol.* 20, 273–281 (1968).
22. Hornsey, M. J. & Fielding, K. S. Attitude roots and jiu jitsu persuasion: Understanding and overcoming the motivated rejection of science. *Am. Psychol.* 72, 459–473 (2017).
23. Amin, A. B. *et al.* Association of moral values with vaccine hesitancy. *Nat. Hum. Behav.* 1, 873–880 (2017).
24. Leask, J. Target the fence-sitters. *Nature* 473, 443–445 (2011).
25. van der Linden, S., Maibach, E., Cook, J., Leiserowitz, A. & Lewandowsky, S. Inoculating against misinformation. *Science (80-.).* 358, 1141.2-1142 (2017).
26. Kahneman, D. Maps of Bounded Rationality: Psychology for Behavioral Economics. *Am. Econ. Rev.* 93, 1449–1475 (2003).
27. Tversky, A. & Kahneman, D. Judgment under Uncertainty: Heuristics and Biases. in *Utility, Probability, and Human Decision Making* 141–162 (Springer Netherlands, 1975). doi:10.1007/978-94-010-1834-0_8
28. Gigerenzer, G. & Goldstein, D. G. Reasoning the Fast and Frugal Way. *Psychol. Rev.* 103, 650–669 (1996).
29. Schwarz, N., Sanna, L. J., Skurnik, I. & Yoon, C. Metacognitive Experiences and the Intricacies of Setting People Straight: Implications for Debiasing and Public Information Campaigns. *Advances in Experimental Social Psychology* 39, 127–161 (2007).
30. Siegrist, M. & Cvetkovich, G. Better negative than positive? Evidence of a bias for negative information about possible health dangers. *Risk Anal.* 21, 199–206 (2001).
31. Betsch, C., Haase, N., Renkewitz, F. & Schmid, P. The narrative bias revisited: What drives the biasing influence of narrative information on risk perceptions? *Judgm. Decis. Mak.* 10, 241–264 (2015).
32. Weaver, K., Garcia, S. M., Schwarz, N. & Miller, D. T. Inferring the popularity of an opinion from its familiarity: A repetitive voice can sound like a chorus. *J. Pers. Soc. Psychol.* 92, 821–833 (2007).
33. Skurnik, I., Yoon, C., Park, D. C. & Schwarz, N. How Warnings about False Claims Become Recommendations. *J. Consum. Res.* 31, 713–724 (2005).
34. Ecker, U. K. H., Lewandowsky, S. & Tang, D. T. W. Explicit warnings reduce but do not eliminate the continued influence of misinformation. *Mem. Cogn.* 38, 1087–1100 (2010).
35. Nickerson, R. S. Confirmation bias: a ubiquitous phenomenon in many guises. *Rev. Gen. Psychol.* 2, 175 (1998).
36. Swire, B., Ecker, U. K. H. & Lewandowsky, S. The role of familiarity in correcting inaccurate information. *J. Exp. Psychol. Learn. Mem. Cogn.* 43, 1948–1961 (2017).
37. van der Linden, S. L., Leiserowitz, A. A., Feinberg, G. D. & Maibach, E. W. The

scientific consensus on climate change as a gateway belief: experimental evidence. *PLoS One* 10, e0118489 (2015).

38. van der Linden, S. L., Clarke, C. E. & Maibach, E. W. Highlighting consensus among medical scientists increases public support for vaccines: evidence from a randomized experiment. *BMC Public Health* 15, 1207 (2015).
39. Vergauwe, J., Wille, B., Hofmans, J., Kaiser, R. B. & De Fruyt, F. The double-edged sword of leader charisma: Understanding the curvilinear relationship between charismatic personality and leader effectiveness. *J. Pers. Soc. Psychol.* 114, 110–130 (2018).
40. Levine, K. J., Muenchen, R. A. & Brooks, A. M. Measuring Transformational and Charismatic Leadership: Why isn't Charisma Measured? *Commun. Monogr.* 77, 576–591 (2010).
41. Antonakis, J., Fenley, M. & Liechti, S. Learning charisma. Transform yourself into the person others want to follow. *Harv Bus Rev* 90, 127–130,147 (2012).
42. Brownell, J. The Skills of Listening-Centered Communication. in *Listening and Human Communication in the 21st Century* 141–157 (Wiley-Blackwell, 2010). doi:10.1002/9781444314908.ch6
43. Brownell, J. *Listening: Attitudes, Principles, and Skills*. (Routledge, 2013). doi:10.1360/zd-2013-43-6-1064
44. Baddeley, A. Working memory. *Science.* 255, 556–559 (1992).
45. Weick, K. E. Small wins: Redefining the scale of social problems. *Am. Psychol.* 39, 40–49 (1984).
46. Bruine de Bruin, W. & Bostrom, A. Assessing what to address in science communication. *Proc. Natl. Acad. Sci.* 110, 14062–14068 (2013).
47. Rakedzon, T., Segev, E., Chapnik, N., Yosef, R. & Baram-Tsabari, A. Automatic jargon identifier for scientists engaging with the public and science communication educators. *PLoS One* 12, e0181742 (2017).
48. Hulme, C., Maughan, S. & Brown, G. D. . Memory for familiar and unfamiliar words: Evidence for a long-term memory contribution to short-term memory span. *J. Mem. Lang.* 30, 685–701 (1991).
49. Jaswal, V. K. & Malone, L. S. Turning believers into skeptics: 3-year-olds' sensitivity to cues to speaker credibility. *J. Cogn. Dev.* 8, 263–283 (2007).
50. World Health Organization Regional office for Europe WHO. Vaccination and trust. (2017). Available at: http://www.euro.who.int/en/health-topics/disease-prevention/vaccines-and-immunization/publications/2017/vaccination-and-trust-2017.
51. Larson, H. J. *et al.* Measuring trust in vaccination: A systematic review. *Hum. Vaccin. Immunother.* 14, 1599–1609 (2018).
52. Henkel, L. A. & Mattson, M. E. Reading is believing: The truth effect and source credibility. *Conscious. Cogn.* 20, 1705–1721 (2011).
53. Eisend, M. A meta-analysis of humor in advertising. *J. Acad. Mark. Sci.* 37, 191–203 (2009).

54. Walter, N., Cody, M. J., Xu, L. Z. & Murphy, S. T. A Priest, a Rabbi, and a Minister Walk into a Bar: A Meta-Analysis of Humor Effects on Persuasion. *Hum. Commun. Res.* 44, 343–373 (2018).
55. Betsch, C., Ulshöfer, C., Renkewitz, F. & Betsch, T. The influence of narrative v. statistical information on perceiving vaccination risks. *Med. Decis. Mak.* 31, 742–753 (2011).
56. PJ, S. Deflecting reactance: The role of similarity in increasing compliance and reducing resistance. *Basic and Applied Social Psychology* 27, 284- (2005).
57. Andre, F. E. *et al.* Vaccination greatly reduces disease, disability, death and inequity worldwide. *Bulletin of the World Health Organization* 86, 140–146 (2008).
58. Betsch, C., Böhm, R. & Korn, L. Inviting free-riders or appealing to prosocial behavior? Game-theoretical reflections on communicating herd immunity in vaccine advocacy. *Heal. Psychol.* 32, 978–985 (2013).
59. Betsch, C., Böhm, R., Korn, L. & Holtmann, C. On the benefits of explaining herd immunity in vaccine advocacy. *Nat. Hum. Behav.* (2017).
60. Shwed, U. & Bearman, P. S. The temporal structure of scientific consensus formation. *Am. Sociol. Rev.* 75, 817–840 (2010).
61. van der Linden, S. L., Leiserowitz, A. A., Feinberg, G. D. & Maibach, E. W. How to communicate the scientific consensus on climate change: plain facts, pie charts or metaphors? *Clim. Change* 126, 255–262 (2014).
62. Myers, T. A., Maibach, E., Peters, E. & Leiserowitz, A. Simple messages help set the record straight about scientific agreement on human-caused climate change: The results of two experiments. *PLoS One* 10, e0120985 (2015).
63. Kata, A. Anti-vaccine activists, Web 2.0, and the postmodern paradigm - An overview of tactics and tropes used online by the anti-vaccination movement. *Vaccine* 30, 3778–3789 (2012).
64. Farrell, J., McConnell, K. & Brulle, R. Evidence-based strategies to combat scientific misinformation. *Nat. Clim. Chang.* 1 (2019). doi:10.1038/s41558-018-0368-6
65. Del Vicario, M., Quattrociocchi, W., Scala, A. & Zollo, F. Polarization and Fake News: Early Warning of Potential Misinformation Targets. *arXiv Prepr. arXiv1802.01400.* (2018).
66. Grabenstein, J. D. What the World's religions teach, applied to vaccines and immune globulins. *Vaccine* 31, 2011–2023 (2013).
67. Sgreccia, E. Moral reflections on vaccines prepared from cells derived from aborted human fetuses. *Pontif. Acad. Pro Vita (Pontifical Acad. Life)* (2005).
68. Paterson, P., Chantler, T. & Larson, H. J. Reasons for non-vaccination: Parental vaccine hesitancy and the childhood influenza vaccination school pilot programme in England. *Vaccine* 36, 5397–5401 (2018).
69. Eggers, P. *et al.* Pertussis outbreak in an Amish community - Kent County, Delaware, September 2004-February 2005. *J. Am. Med. Assoc.* 296, 1960–1964 (2006).
70. Hahn, S. *et al.* Rubella outbreak in an unvaccinated religious community in the

Netherlands spreads to Canada. *Euro Surveill. Bull. Eur. sur les Mal. Transm. = Eur. Commun. Dis. Bull.* 10, (2005).

71. Tomkins, A. *et al.* Controversies in faith and health care. *Lancet* 386, 1776–1785 (2015).
72. Pelčić, G. *et al.* Religious exception for vaccination or religious excuses for avoiding vaccination. *Croat. Med. J.* 57, 516–521 (2016).
73. Reynolds, B. J. When the facts are just not enough: Credibly communicating about risk is riskier when emotions run high and time is short. *Toxicology and Applied Pharmacology* 254, 206–214 (2011).
74. Bono, J. E. & Ilies, R. Charisma, positive emotions and mood contagion. *Leadersh. Q.* 17, 317–334 (2006).
75. Baum, J. R. & Locke, E. A. The relationship of entrepreneurial traits, skill, and motivation to subsequent venture growth. *Journal of Applied Psychology* 89, 587–598 (2004).
76. Petty, R. E. & Cacioppo, J. T. The Elaboration Likelihood Model of Persuasion. in *Communication and Persuasion* 1–24 (Springer New York, 1986). doi:10.1007/978-1-4612-4964-1_1
77. McKiernan, E. C. *et al.* How open science helps researchers succeed. *eLife* 5, (2016).
78. Butler, D. Investigating journals: The dark side of publishing. *Nature* 495, 433–435 (2013).
79. Camacho, M. & Reckley, L. K. Predatory journals: Enough is enough. *Laryngoscope* 128, 1510–1510 (2018).
80. Singh Chawla, D. The undercover academic keeping tabs on ‘predatory’ publishing. *Nature* 555, 422–423 (2018).
81. Beall, J. Beall’s list of predatory journals and publishers. Available at: https://beallslist.weebly.com. (Accessed: 15th January 2019)
82. Bowman, J. D. Predatory publishing, questionable peer review, and fraudulent conferences. *Am. J. Pharm. Educ.* 78, 1–6 (2014).

Annex 1: HURIER model of listening instruction+

Individual Listening Filters

Organizational role Attitudes Previous experiences Values Bias Etc.

Hearing

Understanding

Interpreting

Evaluating

Remembering

Responding

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The HURIER Model visualizes six interrelated skills of listening; hearing, understanding, remembering, interpreting, evaluating and responding. By identifying and addressing these skills listening can be learned in sub steps:

- **Hearing:** listening is determined by the physiological process of hearing sounds. This also involves the management of your attention and focus.

- **Understanding, interpreting, evaluating:** after receiving what was being said you automatically try to understand, interpret and evaluate the message. Especially these three sub steps are influenced by interpersonal relations and the context, e.g. your organizational role, attitudes, personal experiences, values and cognitive bias. By reflecting on these individual listening filters you improve your listening skill and reduce misunderstandings.

- **Remembering:** the next step is your memory. Being able to remember the most important parts of a message and inhibit unnecessary information will enable you to respond in an appropriate way.

- **Responding:** your response, as the final listening step, reveals your ability to listen to your discussion partner.

The general public, i.e. your key audience, will judge your performance based on your ability to pay attention to understand, interpret, evaluate and remember what the vocal vaccine denier said.

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